This repository was created with the objective to solve the problems shared in the website: <https://projecteuler.net/>

**Exercises description**

**16.** 215 = 32768 and the sum of its digits is 3 + 2 + 7 + 6 + 8 = 26. What is the sum of the digits of the number 21000?

**19.** You are given the following information, but you may prefer to do some research for yourself.

* 1 Jan 1900 was a Monday.
* Thirty days has September,  
  April, June and November.  
  All the rest have thirty-one,  
  Saving February alone,  
  Which has twenty-eight, rain or shine.  
  And on leap years, twenty-nine.
* A leap year occurs on any year evenly divisible by 4, but not on a century unless it is divisible by 400.

How many Sundays fell on the first of the month during the twentieth century (1 Jan 1901 to 31 Dec 2000)?

**22.** Using **p022\_names.txt** (right click and 'Save Link/Target As...'), a 46K text file containing over five-thousand first names, begin by sorting it into alphabetical order. Then working out the alphabetical value for each name, multiply this value by its alphabetical position in the list to obtain a name score.

For example, when the list is sorted into alphabetical order, COLIN, which is worth 3 + 15 + 12 + 9 + 14 = 53, is the 938th name in the list. So, COLIN would obtain a score of 938 × 53 = 49714.

What is the total of all the name scores in the file?

**24.** A permutation is an ordered arrangement of objects. For example, 3124 is one possible permutation of the digits 1, 2, 3 and 4. If all of the permutations are listed numerically or alphabetically, we call it lexicographic order. The lexicographic permutations of 0, 1 and 2 are:

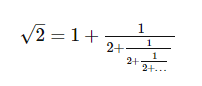
012   021   102   120   201   210

What is the millionth lexicographic permutation of the digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9?

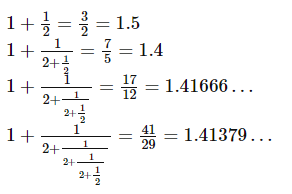
**37.** The number 3797 has an interesting property. Being prime itself, it is possible to continuously remove digits from left to right, and remain prime at each stage: 3797, 797, 97, and 7. Similarly we can work from right to left: 3797, 379, 37, and 3. Find the sum of the only eleven primes that are both truncatable from left to right and right to left.

**NOTE:** 2, 3, 5, and 7 are not considered to be truncatable primes.

**57.** It is possible to show that the square root of two can be expressed as an infinite continued fraction.



By expanding this for the first four iterations, we get:



The next three expansions are 99/70, 239/169, and 577/408, but the eighth expansion, 1393/985, is the first example where the number of digits in the numerator exceeds the number of digits in the denominator.

In the first one-thousand expansions, how many fractions contain a numerator with more digits than the denominator?